STROMBOMONAS TAIWANENSIS NOV. SP. (EUGLENOPHYTA, EUGLENOPHYCEAE)

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ABSTRACT — The authors describe by mean of photonic and scanning electron microscopes a new species of the genus *Strombomonas*, *S. taiwanensis* sampled in a small pond in Taïwan (China). This taxa differs from the others by its lorica morphology and by its ring-like paramylon.

RÉSUMÉ — Les auteurs décrivent, à l'aide des microscopes photonique et électronique à balayage, une nouvelle espèce de *Strombomonas*, *S. taiwanensis* récoltée dans un petit étang à Taïwan (Chine). Celle-ci se distingue des autres taxons par la morphologie de sa logette et par la forme annelée de ses réserves de paramylon.

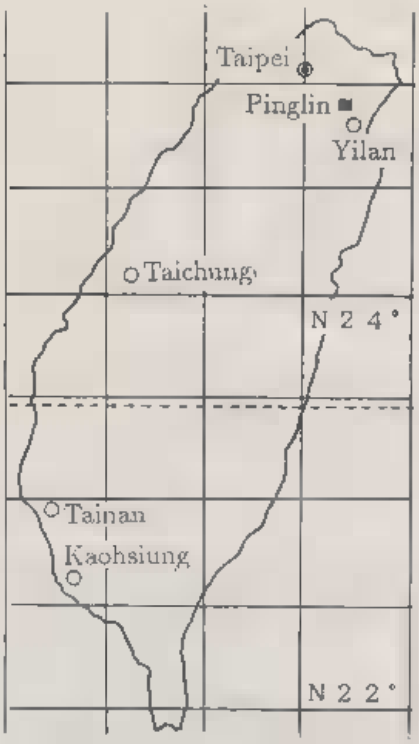
KEY WORDS — Euglenophyta, Euglenophyceae, new taxa, Taïwan, ultrastructure, taxonomy.

INTRODUCTION

During a trip in Taïwan (China), in May 1988, different samples of planctonic freshwater algae have been collected by one of the authors [1]. Between the diverse taxa which have been observed, one of them of euglenoïd type, morphologically similar both with genus *Euglena* Ehrenberg and *Strombomonas* Deflandre, has seemed to us very interesting by its morphology and the granular aspect of its sheath. As it was abundant it was possible to try to study it by mean of scanning electron microscope to state precisely its taxonomical position.

MATERIAL AND METHODS

The biological material was sampled in May 1988 in Taïwan (China), in the vicinity of Pinglin (NE of the island; see the map) in a small narrow pond used for



irrigation. The algae were collected with a plancton net (mesh side: 25 µm). Physico-chemical data concerning the pond were impossible to be mesured.

Fixation has been done with a solution of formaline in water (concentration: 4 %). The reference number of the sample is: TYF 481.

For scanning electron microscope, cells have been selected with the help of a micropipette under binocular and after rinsing with distilled water they have been directly put on the stub according to the method recommended by Couté and Thérézien (1994).

The photographs have been taken on the scanning electron microscope JEOL JSM 840 A of the service commun des laboratoires des Sciences de la Vie of the National Museum of Natural History of Paris.

RESULTS

The cells are fusiform more or less swollen in their middle part and their two apical parts are morphologically different (fig. 1 to 12). The posterior one (L: 18-22 µm) ends by a very tapered tip (fig. 20-21-23) nearly completely colourless. The anterior part (l: 2-4 µm) is generally colourless too, opened at its apex by a pore often obliquely cutted (fig. 1-2-5-19-22). The cell median enlargement varies in dimensions (L: 13-20,2 µm) and in location. In fact some cells are larger whether at the base of the anterior or posterior apical end than in the middle part (fig. 1-4-7-9).

With photonic microscope, the cell appears included in a translucent colourless lorica the wall of which seems lightly rough (fig. 1 to 12 and 19-20). With scanning electron microscope (fig. 13 to 18 and 21 to 26) the lorica wall appears covered by numerous particles the morphology and dimensions of which are very much various. Sometimes bacteria are sticked on the lorica surface (fig. 25). When the lorica is broken (fig. 17-18) it is possible to observe the pellicular strips which cover the cell body. The lorica wall is very thin.

Allowing for the sampling circumstances it was impossible to observe the flagella and to know exactly if the cell is contractile or not.

Chloroplasts are numerous, discoïd, parietal, small, probably green and scattered in the cell body. The storages appear like two ring-shaped (L: 12-14 µm) paramylon grains (fig. 2-4-6-12) disposed along the antero-posterior cell axis.

Dimensions: L_{lorica} = 60-95 µm; l_{lorica} = 11-19 µm; l_{pore} = 2-4 µm
L_{cell} = (55)-65-84 µm; l_{cell} = 9-17 µm

Latin diagnosis:

Cellula fusiformis in media parte inflata et in una hyalina leviter granulata lorica inclusa. Posterior pars in acerosa caudata. Anterior pars (collum) paulo longius quam latius et cum leviter obliquo collo. Chromatophora numerosa, verisimiliter viridia, parietalia, parva et dispersa. Duo grana magna et annularia paramyli. Dimensiones loricae: L = 60-95 µm; l: 11-19 µm; diameter colli: 2-4 µm; caudae longitudo: 18-22 µm.

Dimensiones cellulae: L= (55)-65-84 µm; l= 9-17 µm.

Habitatio: in parva lacuna irrigationis prope Pinglin in Taïwan (Sina) insula, Maio mense 1988.

Iconotypus: fig. nost. 1 et 13
Cellulae in herbario Tokyo Plankton Institute, Kanagawa, Japan depositae.

In the sample where the new species has been found, the accompanying algae were scarce. However some of them have been identified and their names are given as following:

Euglenaceae: *Euglena oxyuris* Schmarda
Lepocinclis fusiformis (Carter) Lemm. em. Conr.
L. ovum var. *bütschlii* Conr.
Phacus hamatus Pochm.
P. triqueter (E.) Duj.
Strombomonas triquetra (Playf.) Defl.
Chlorophyceae: *Pediastrum duplex* Meyen
P. simplex Meyen
Scenedesmus Meyen sp.

DISCUSSION AND CONCLUSION

The organism sampled in Taïwan and examined here is truly an Euglenophyceae because of the pelticular strips on its cell body surface and of the paramylon storages.

The presence of a thin colourless lorica authorizes to conclude that it is not the genus *Euglena* Ehrbg. Moreover the apical pore demonstrates that it is not an encysted *Euglena*. As the lorica is not ornamented with ponctuations, spines or scrobiculations, this alga is not a *Trachelomonas* Ehrbg. Finally the fusiform cell morphology with the anterior part attenuated in a collar and the posterior one tapered like a tail and especially the aggregation of mineral and organic particles on the lorica wall surface indicate that our taxon belongs to the genus *Strombomonas* as defined by Deflandre (1930).

This alga differs from all the other species of the genus by its very characteristic morphology. Nevertheless it presents some resemblances with *Strom-*

bomonas maxima (Skvortzov) Deflandre (1930) by its general outline (but this last species has a smooth lorica surface and granular paramylon) and with *S. fluviatilis* (Lemm.) Deflandre (1930) and peculiarly with the variety *levis* (Lemm.) Skvortzov (1925) (described first from China and which possesses an obliquely cutted apical pore) or with the other variety *major* found in Brazil by Conforti (1993). It differs from these two last varieties by its fusiform morphology, its colourless lorica wall (and not brown light) and especially by its ring-shaped paramylon storages. This last character is very similar by the number and the morphology of paramylon granules with the one of *Euglena oxyuris* Schmarda (1846). It is a very new storage organisation for the genus *Strombomonas* in which no species is known containing such type of paramylon ring-shaped granules except perhaps for *S. girardiana* var. *maxima* Martinez (1978) described from the Philippines and represented with two rings (p. 318, fig. 19) but of undefined nature.

All the above mentioned characters are enough to consider the alga from Taïwan as a new species of the genus *Strombomonas*. We propose to name it *Strombomonas taiwanensis* nov. sp.

However to be completely sure with this identification, it would be necessary to observe this organism living to determine the presence or absence of flagellum and to count their number.

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LEGENDS OF FIGURES

Figures 1 to 26: *Strombomonas taiwanensis* nov. sp.

Fig. 1 to 12: photonic microscope; different cells showing the morphological variability. The two ring-shaped paramylon are conspicuous on fig. 2, 4, 6 and 10.

Fig. 13 to 18: Scanning electron microscope;

Fig. 13 to 16: four different cells; fig. 17-18: details of the broken lorica wall of two different cells. The pellicular strips are well perceptible.

Fig. 19-20: photonic microscope

Fig. 19: anterior and median parts of a cell. The lorica wall surface appears covered by numerous particles.

Fig. 20: posterior and median parts of a cell.

Fig. 21 to 26: scanning electron microscope;

Fig. 21 and 23: two posterior apex or tails

Fig. 22 and 24: two anterior apex with collar

Fig. 25 and 26: details of the median region of two different cells. Bacteria are present (fig. 25, arrows).

For all the figures scale bare values are given in micrometres.